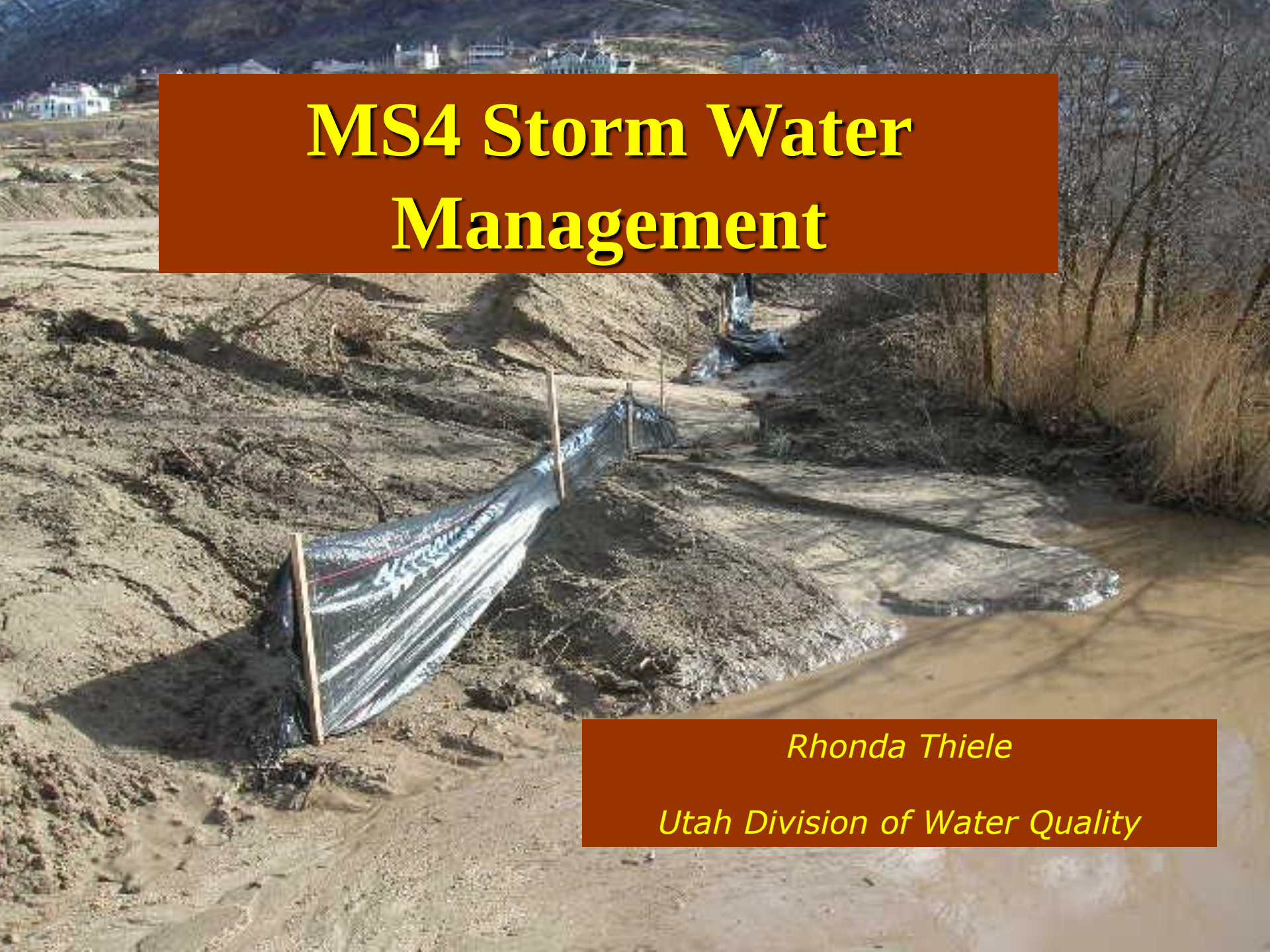


MS4 Storm Water Management

Rhonda Thiele

Utah Division of Water Quality

What is an MS4? (Municipal Separate Storm Sewer System)

The term "MS4" is commonly used to describe both:

- The infrastructure used to convey storm water runoff
- The owner/operator of the infrastructure that is permitted to discharge this runoff

Storm Water Pollution

- As of 2005, 40% of U.S. waterbodies are still impaired
- A leading source of this impairment is polluted runoff
- EPA has placed increasing emphasis on addressing Storm Water issues

UPDES Phase I

- 1990 - **Phase I** UPDES storm water program established
- Phase I - required UPDES permit coverage;
  - large or medium municipalities; populations of 100,000 or more.
  - construction sites larger than 5 acres
  - 3 Utah Entities covered
    - Salt Lake City, Salt Lake County, UDOT

UPDES Phase II

- 2002 - **Phase II** UPDES storm water permit issued in Utah
- **Phase II -** required UPDES permit coverage;
  - ***Urban Areas*** Population Densities of Greater than 1000/people per Sq. Mile
  - ***Outside Urban Areas***
    - populations of 10,000 or greater if meeting criteria
    - Physically interconnected systems
    - WQ violations, or significant contributors of pollutants

Phase II cont.

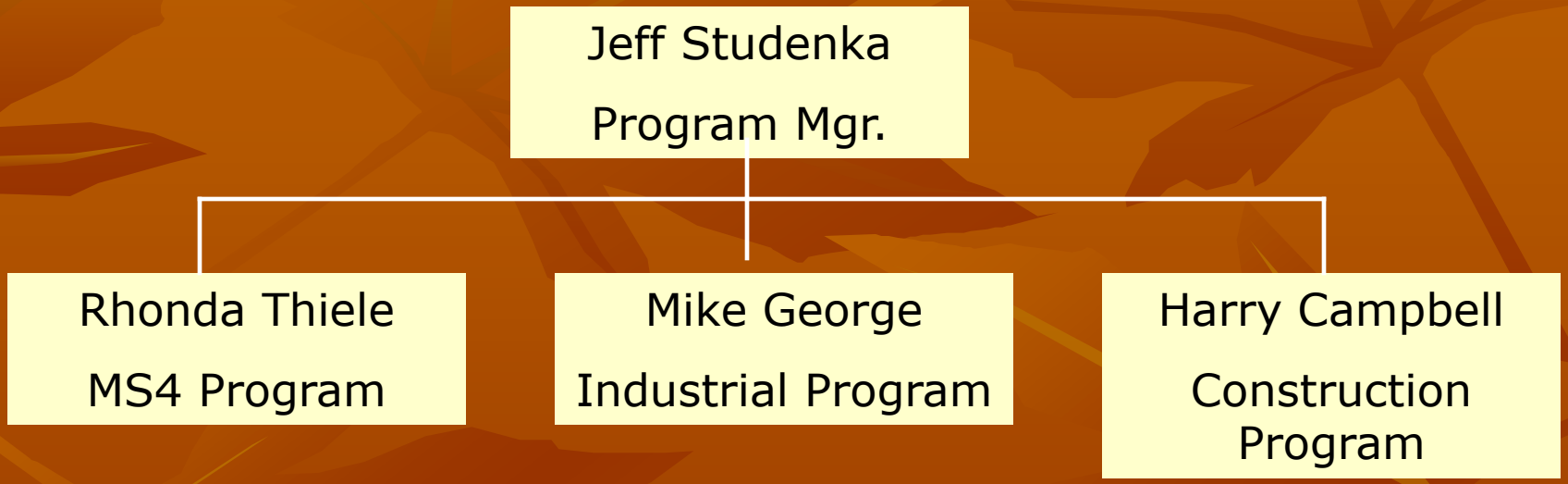
- designated for permit coverage by the *Executive Secretary*
- Construction sites greater than or equal to **1 acre**
- 75 Utah Municipalities covered

MS4 Permitting

- An ***urbanized area*** (**UA**) is a land area comprising one or more places – central place(s) – and the adjacent densely settled surrounding area – urban fringe – that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile. It is a calculation used by the Bureau of the Census to determine the geographic boundaries of the most heavily developed and dense urban areas.


Music
Handmade
FOLK
BLUES
One Man Band
RAMBLIN' CONRAD
RAMBLIN'
CONRAD
SINGS · FOLK · BLUES
One-Man-Band

Utah's Current Storm Water Program



MS4 Permit Improvement Guide

http://www.epa.gov/npdespub/pubs/ms4permit_improvement_guide.pdf

- **EPA has begun rulemaking to strengthen the storm water program**

- **The guide is intended to assist NPDES permitting authority staff to:**
  - Strengthen MS4 permits
  - Clear, specific, measurable, enforceable permit requirements

MS4 Permits

- **Six Minimum Control Measures**
  - Public Education and Outreach on Storm Water Impacts
  - Public Involvement/Participation
  - Illicit Discharge Detection and Elimination (IDDE)
  - Construction Site Storm Water Runoff Control
  - Long-Term Storm Water Management in New Development and Redevelopment (Post-Construction)
  - Pollution Prevention and Good Housekeeping for Municipal Operations

Public Education and Outreach

- (1) Residents, (2) businesses, institutions, and commercial facilities, (3) developers and contractors, and (4) MS4 industrial facilities
- Outreach & educational efforts should include a multimedia approach
- Provide and document info. given to the public about the **MS4's prohibitions against illicit discharges** and improper disposal of waste.
- Septic system maintenance, lawn care, benefits of on-site infiltration of storm water, effects of auto work, car washing on WQ, proper disposal of pool water, pet waste

Public Education and Outreach

- **Businesses and Institutions/MS4-owned/operated Facilities**
  - Proper lawn maintenance
  - Benefits of on-site infiltration
  - Building & equipment maintenance
  - Salt/deicing materials
  - Proper storage of materials (pollution prevention)
  - Proper mgmt. of waste materials & dumpsters
  - Proper mgmt. of parking lot surfaces (sweeping)

Public Education and Outreach

- **Construction: developers, contractors, engineers, development review staff, land use planners**
  - Provide and document any information and training
  - SWPPPs & BMPs
  - Low Impact Development (LID) practices
  - Specific requirements for long-term storm water management (post-construction)

Public Participation/Involvement

- Comply with State and Local public notice requirements
- Advisory panels, public hearings, watershed committees, stewardship programs, volunteer opportunities
- Storm drain stenciling, community clean-ups, citizen watch groups, “Adopt a Storm Drain” programs
- Current SWMP online for public review and input for the life of the Permit.

Illicit Discharge Detection and Elimination (IDDE)

- A discharge to an MS4 that is *not composed entirely of storm water* except those listed in permit.

Illicit Discharge Detection and Elimination (IDDE)

Program Components:

- Storm Sewer System Mapping
- Routine Dry Weather Screening of outfalls
  - Inspection Form
- Ordinance or other Regulatory Mechanism
- Investigation of Suspected Illicit Discharges and/or Improper Disposal
  - SOPs, inspection report
- Escalating Enforcement Procedures

Illicit Discharge Detection and Elimination (IDDE) (cont.)

Program Components:

- Develop and implement written systematic procedures for locating and listing the following priority areas:
  - Areas with older infrastructure more likely to have illicit connections
  - Industrial, commercial, or mixed use areas
  - Areas with a history of past illicit discharges
  - Areas with a history of illegal dumping
  - Areas with onsite sewage disposal systems
  - Areas with older sewer lines or with a history of sewer overflows or cross-connections
  - Areas upstream of sensitive waterbodies

Illicit Discharge Detection and Elimination (IDDE) (cont.)

Program Components:

- Field assessment activities to verify outfall locations, detect illicit discharges, including dry weather screening of outfalls/facilities serving priority areas:
  - 20 percent of priority areas by August 1, 2011
  - Additional 20 percent of priority areas each year thereafter.

Illicit Discharge Detection and Elimination (IDDE) (cont.)

- Inform public of hazards associated with illegal discharges and improper disposal of waste
- Publicly list and publicize a hotline/other local telephone number for reporting
- Written spill/illegal dumping response procedure, including contract staff and other responsible entities
- Promote or Provide HHW Services
- Municipal Staff Education and Training

Construction Site Storm Water Runoff Control

Construction Site Storm Water Runoff Control

- Ordinance/Other regulatory mechanism that requires ESC practices at construction sites
  - Construction Site SWPPPs and BMPs
  - Concrete washout, off-site tracking, chemicals, litter, sanitary waste
- Pre-construction SWPPP Review Procedures and Checklist
  - Procedures for an evaluation of opportunities for the use of LID practices (long-term storm water management)

Construction Site Storm Water Runoff Control (cont.)

- Construction Site Inspections using State Inspection Form (Checklist)
- Identify Priority Construction Sites
- Monthly Inspections
- Biweekly Inspections (Priority Sites)
  - Proximity to waterbody
  - Soil erosion potential
  - Site slope
  - Project size
  - Sensitivity to receiving water
  - Past record of non-compliance by operators
- Escalating Enforcement Procedures
- Training and Education

Construction Site Storm Water Runoff Control

- Prior to Land Disturbance: to ensure all BMP's are in place.
- During Active Construction
- Following Active Construction: to ensure final stabilization; all temporary BMP's removed.

Pollution Prevention and Good Housekeeping for Municipal Operations

- O & M Programs
  - Facilities Inventory
  - SOPs
  - Inspections
  - Employee Training

Pollution Prevention and Good Housekeeping for Municipal Operations

- O & M Program for MunicipalOperations/Facilities/Controls
  - Storm water collection and conveyance systems
  - Roads, highways, and parking lots
  - Vehicle fleets
  - Municipal buildings
  - Parks and Open Space
  - Vehicle and equipment maintenance shops

Pollution Prevention and Good Housekeeping for Municipal Operations

- Facility, Operations, Storm Water Controls Inventory
- High-priority facilities: those having a high potential to generate storm water pollutants
  - Sediment, nutrients, hydrocarbons, pesticides, chlorine, trash, bacteria

Pollution Prevention and Good Housekeeping for Municipal Operations

- Facility, Operations, Storm Water Controls Inventory
- SOP's
- High-priority facilities: those having a high potential to generate storm water pollutants
  - Sediment, nutrients, hydrocarbons, pesticides, chlorine, trash, bacteria

Pollution Prevention and Good Housekeeping for Municipal Operations

- SOPs should include BMPs that, when applied to the municipal operation, facility or storm water control will protect water quality and reduce the discharge of pollutants to the MS4.

Pollution Prevention and Good Housekeeping for Municipal Operations

- High Priority Facilities
  - Material/heavy equipment storage areas
  - Maintenance areas
  - Parks and open space
  - Fleets
  - Roads, highways, and parking lots

Pollution Prevention and Good Housekeeping for Municipal Operations

- Inspections (high-priority)
  - Weekly visual inspections (refer to SOPs) tracked in a log. Identify deficiencies and corrective actions
  - Quarterly comprehensive inspections. Document using an inspection reports noting deficiencies and corrective actions.
  - Quarterly visual. Any observed problems (e.g., color, foam, sheen, turbidity) associated with pollutant sources or controls. Inspection report.

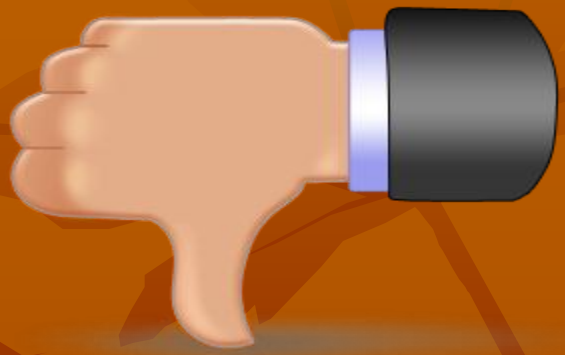
Municipal Staff Education and Training

- What type of training do field staff (e.g., storm sewer maintenance crews, street sweepers) receive on spill response and IDDE? In-house training.

- Are staff generally educated about what illicit discharges are and how to report them?

Improper Disposal Practices

Improper Disposal Practices



Good Housekeeping???

Long-Term Storm Water Management (Post-Construction)

- Objectives:
  - Mimic pre-development hydrology of the previously undeveloped site; or
  - Improve the hydrology of a redeveloped site and reduce the discharge of storm water
  - Private and public development
  - Evaluate and encourage a LID approach where practicable
    - Infiltrate, evapotranspire or harvest and use storm water

Long-Term Storm Water Management (Post-Construction)

- Ordinance or other regulatory mechanism that requires long-term post-construction storm water controls
  - Require BMP selection, design, installation, O & M necessary to protect water quality and reduce discharge of pollutants to MS4
  - Both construction-phase and post-construction phase access to inspect (O & M)
  - Escalating enforcement procedures
  - Bill or recoup costs from property owners

Long-Term Storm Water Management (Post-Construction)

- Site plan reviews that incorporate consideration of WQ impacts
- Pre-construction SWPPP review to ensure they include long-term storm water management measures
- Permanent structural BMPs inspected at least once during installation
- Inspections and any necessary maintenance conducted annually (either by Permittee/agreement)
- Permittee inspects at least once every 5 years; document with inspection report

Long-Term Storm Water Management (Post-Construction)

- Include provisions to allow permittees to inspect BMPs on private property or require private property owners to provide annual certification by a qualified third party that adequate maintenance has been performed

Regular inspection and maintenance of storm water best management practices is important to ensure that the practices are functioning properly and to remove trash and organic debris

Long-Term Storm Water Management (Post-Construction)

- Structural BMPs: storm water retention, grassed or vegetative swales, stream buffers, vegetative filter strips, infiltration basins, energy dissipaters, constructed wetlands, sand filters, etc.
- Green infrastructure practices: rainwater harvesting, rain gardens, permeable pavement, and vegetative swales

Long-Term Storm Water Management (Post-Construction)

- Infiltration islands in parking lots can help reduce storm water runoff.

Long-Term Storm Water Management (Post-Construction)

- Non-Structural:
  - minimizing development in areas susceptible to erosion and sediment loss
  - minimize disturbance of native soils and vegetation
  - limiting growth to identified areas
  - minimizing imperviousness
  - maintaining open space,
  - protecting sensitive areas; wetlands and stream buffers
  - preserving natural drainage patterns
  - education for developers and the public about project designs that minimize water quality impacts

Long-Term Storm Water Management (Post-Construction)

- Develop a plan to retrofit existing developed sites that are adversely impacting WQ.
  - Emphasis on controls that infiltrate, evapotranspire, and harvest/use storm water
  - Rank control measures to determine those best suited for retrofitting as well as those that could later be considered.

Long-Term Storm Water Management (Post-Construction)

- Inventory of potential retrofit locations should consider locations that:
  - Contribute POCs to impaired waterbody
  - Contribute to receiving waters that are significantly eroded
  - Tributary to a sensitive or protected area
  - Tributary to areas prone to flooding

Long-Term Storm Water Management (Post-Construction)

- Prioritize retrofit locations:
  - Cost effectiveness
  - Pollutant removal effectiveness
  - Amount of impervious area potentially treated
  - Maintenance requirements
  - Aesthetic qualities

Long-Term Storm Water Management (Post-Construction)

- Training
- Inventory of all structural storm water control measures (both private and public)
  - Maintenance requirements
  - Inspection information

SWMP

- Clear, written plan, with measurable goals, that describes the storm water program and how it relates to water quality.

- **iterative process** of evaluating its storm water program.

- **Iterative process**: Develop, implement, evaluate, and repeat.

SWMP Requirements

- Specific BMPs (specific activity)
- Measurable Goals (quantifiable)
  - How many? How often?
  - Completed by When? Months and years of implementation
  - Interim milestones
  - Frequency of actions
  - Reviewed and updated at least annually

The Audit

Records Review

- Ordinances
- Written procedures
- Inspections
- Plan review, checklists
- Municipal SOPs and Maintenance Schedules

Field Based Activities

- Construction Site Inspections
- Municipal Facilities inspections

Common Compliance Problems

- Lack of basic permit knowledge
- Lack of SWMP review and modification
- Lack of Documentation i.e., written procedures, checklists, inspection forms, rationale statement
- Improper waste and wastewater disposal
- Failure to conduct necessary inspections

Proper Documentation

- Track and Document everything!!
  - Students educated
  - Water fair participants, educational materials distributed
  - phone calls received, complaints received
  - Training program attendees
  - Number of volunteers
  - Specific days, location, tasks and number of volunteers
  - Procedures, SOPs: enforcement, plan review, tracing an illicit discharge, MS4 P2 activities
- List of measurable parameters

http://www.epa.gov/npdes/pubs/measurablegoals.pdf

RESOURCES

- Phase II Final Rule Fact Sheet Series
  www.epa.gov/npdes/stormwater/swfinal
- National Menu of Stormwater Best Management Practices
  www.epa.gov/npdes/stormwater/menuofbmps
- **MS4 Permit Improvement Guide**
  http://www.epa.gov/npdespub/pubs/ms4permit_improvement_guide.pdf
- **http://cfpub.epa.gov/npdes/home.cfm?program_id=6**


Questions?
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